Comparing Futures for the Sacramento-San Joaquin Delta

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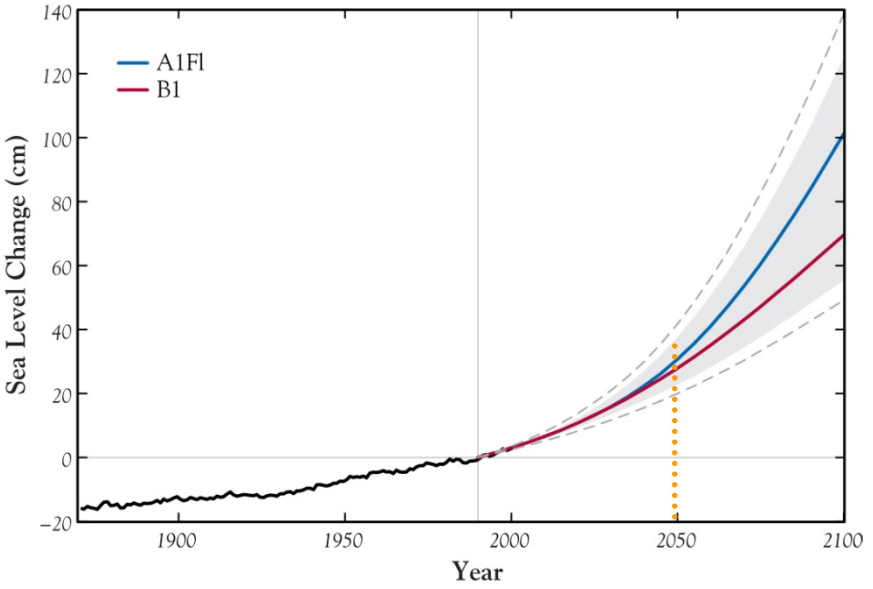
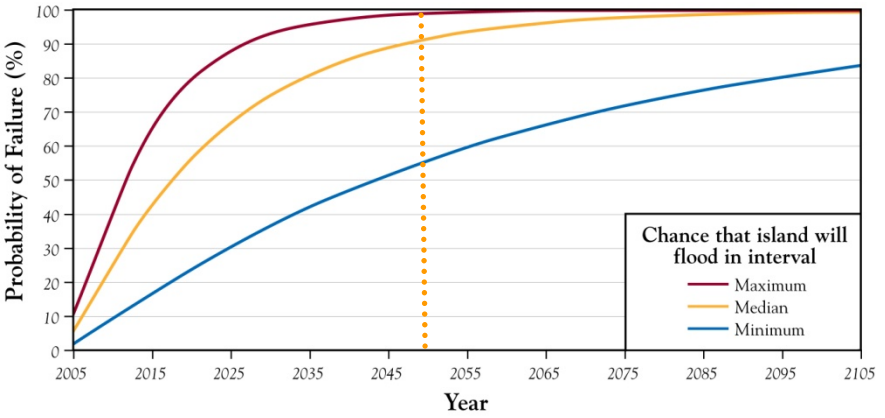
Prepare for Fundamental, Inevitable, and Irreversible Change



Sea level rise: 1 ft by 2050, 3 ft by 2100

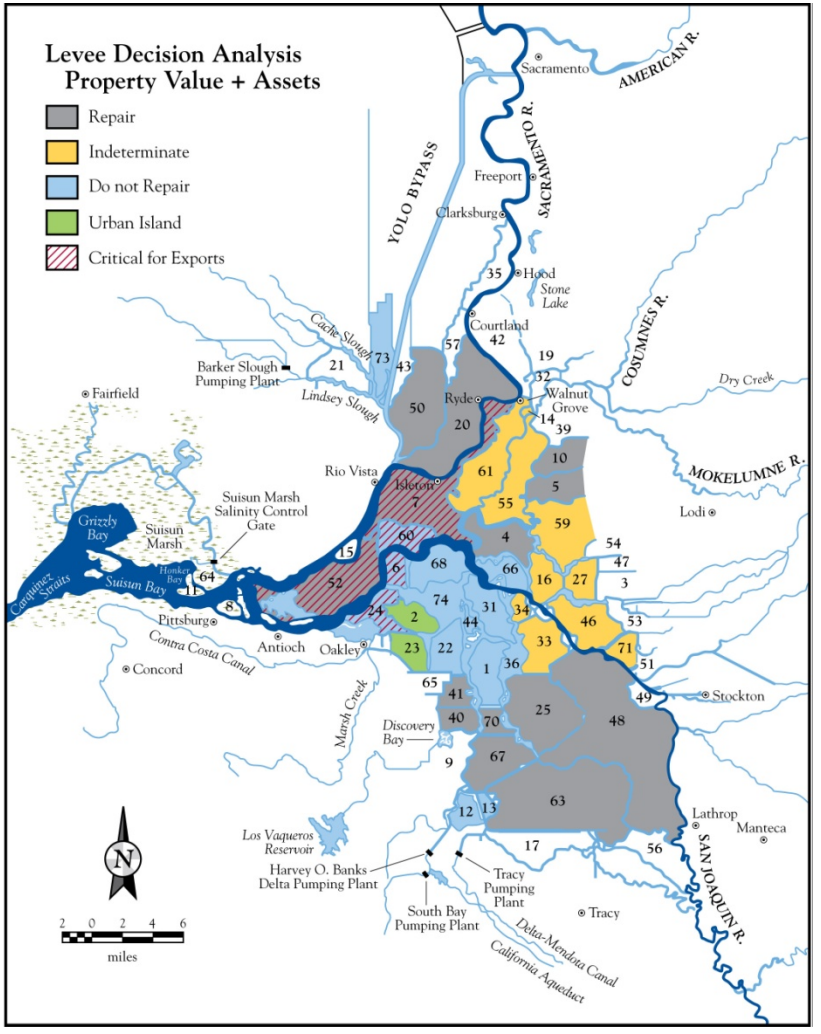


Median chance of island flooding by 2050: 95%

- Delta is at a tipping point
  - Land subsidence
  - Sea level rise
  - Floods
  - Future earthquakes
- Ecosystem changes
  - Invasive species
  - Habitat alteration
- Prohibitive costs for maintaining all islands

Sources: Rahmstorf, 2007; draft DRMS phase

Delta of Tomorrow Will be Different

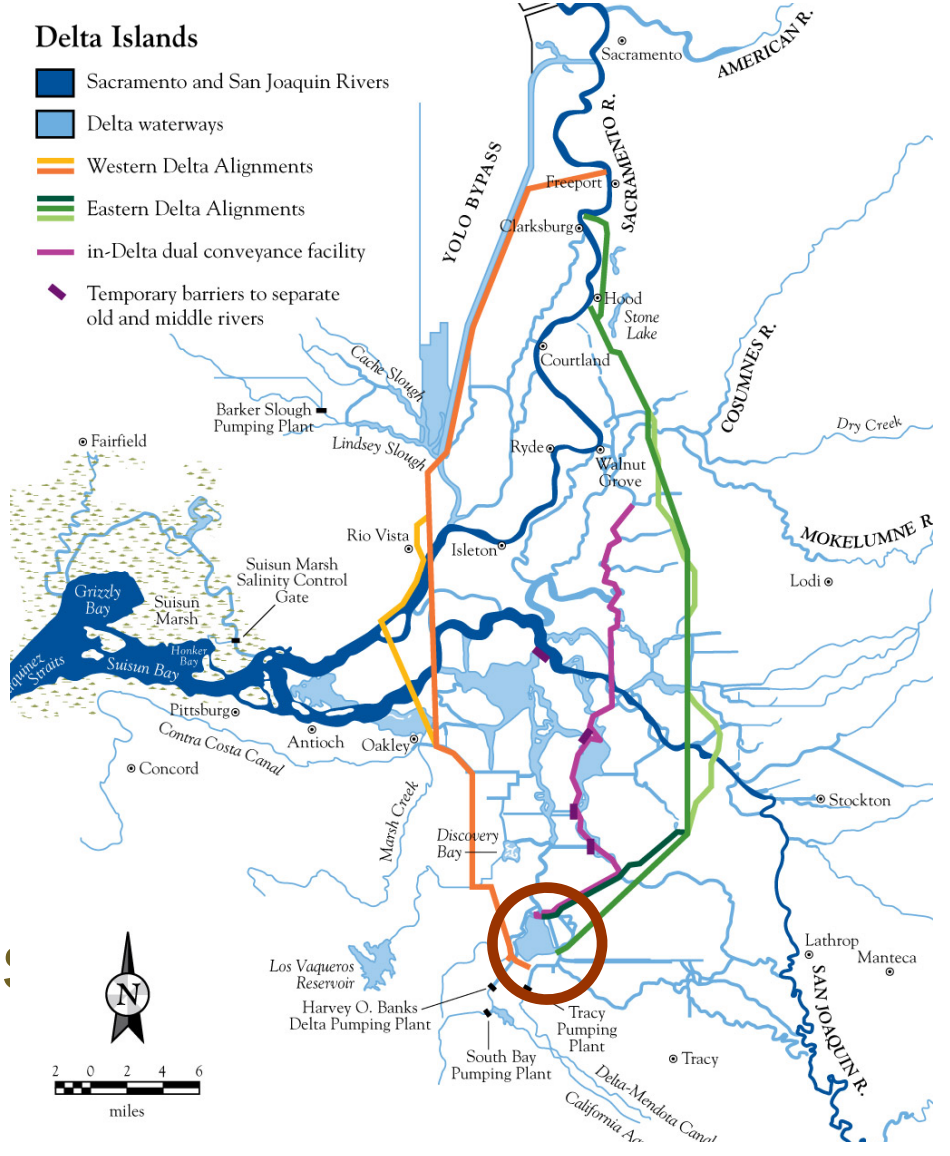


Based on economic value of land and assets, many islands not worth repairing after flooding (blue)

- Large bodies of open water and higher sea level
- Increased salinity, habitat variability
- Higher water quality costs – even if all islands remain intact

Comparing Water Export Strategies Long-Term (to Mid-Century)

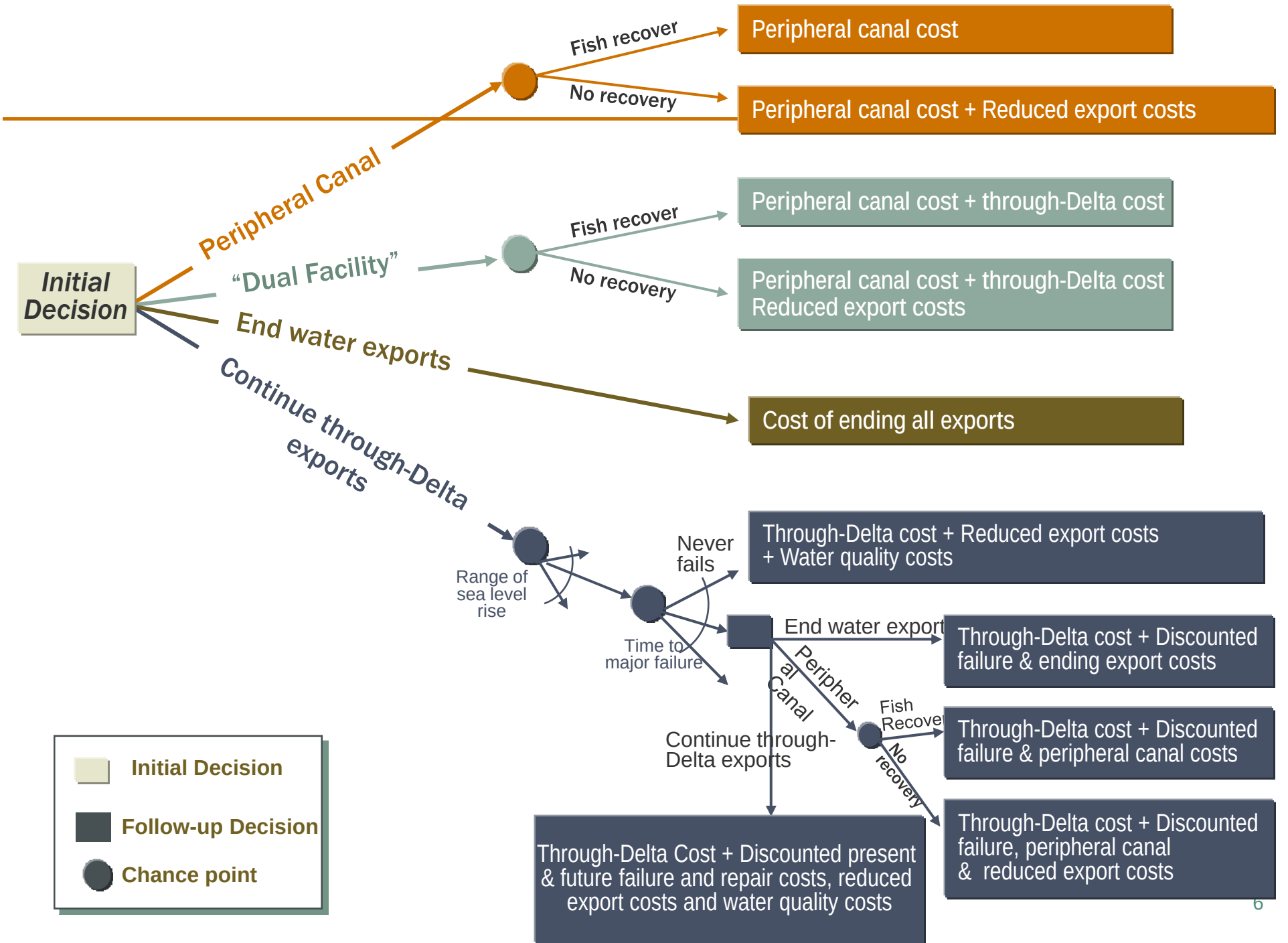
- Current Strategy: through the Delta
- Peripheral Canal: around the Delta
- Dual Conveyance: both through and around the Delta
- No Exports: use other water sources and use less



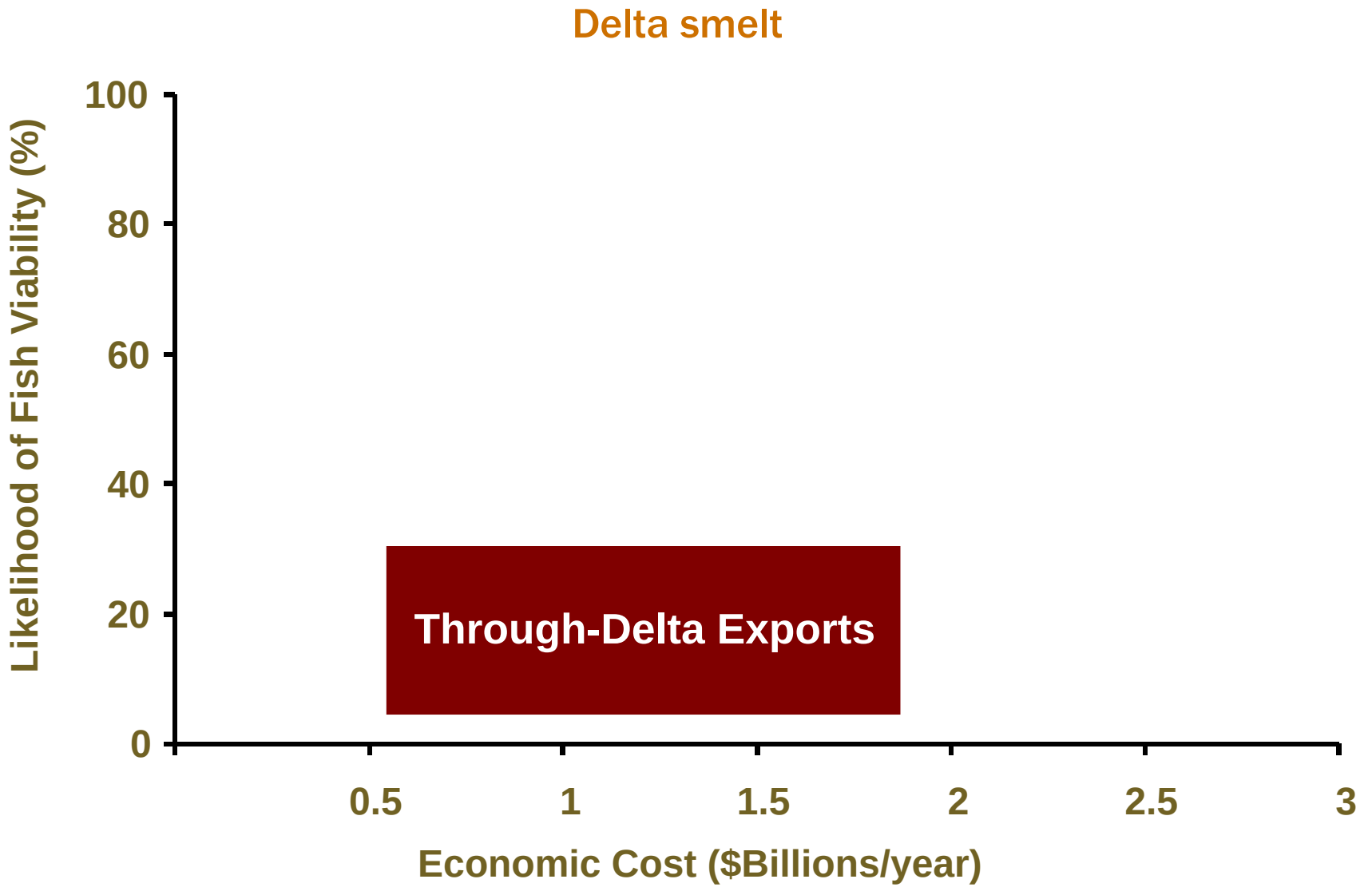
Evaluation Criteria: "Co-Equal" Goals

- Delta ecosystem
  - Delta Vision: "sustainable environment"
  - Our report: viability of native fish populations
  - Expert judgment
- Water supply
  - Delta Vision: "reliable water supply"
  - Our report: statewide economic costs
  - Construction & operations, water quality, supply cutbacks
- Use ranges to capture uncertainty

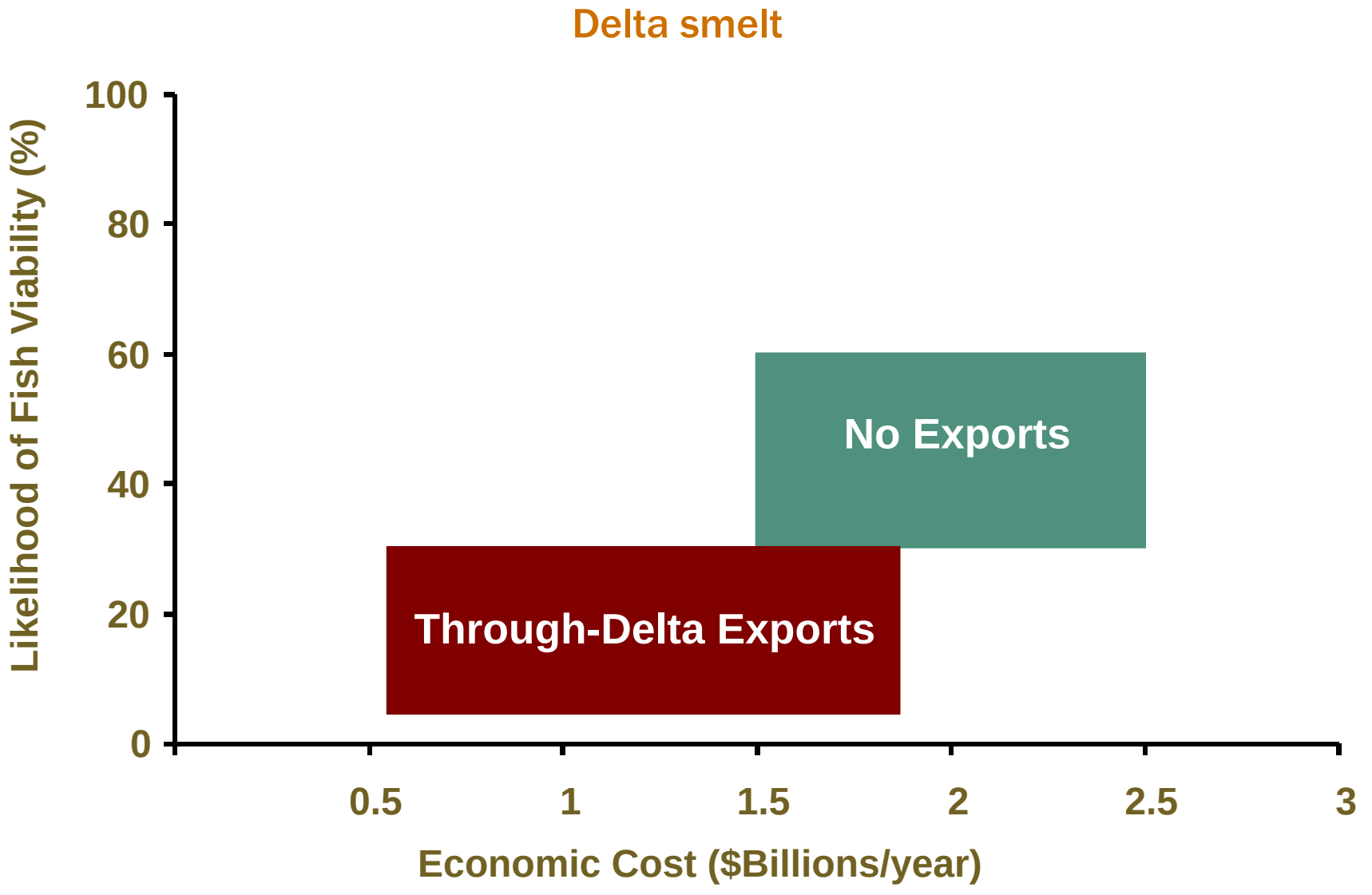
Decision Tree for Economic Cost



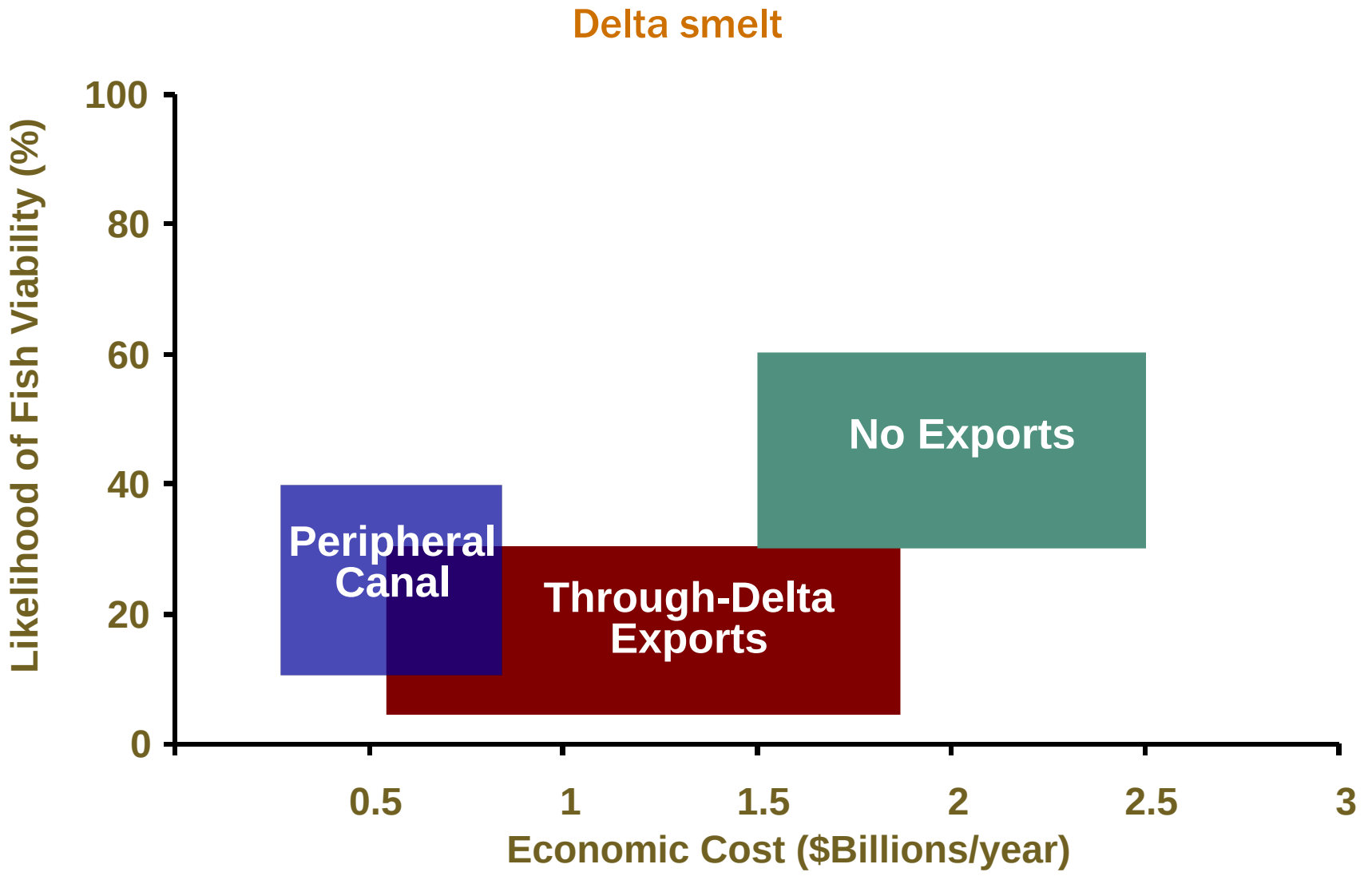
Through-Delta Pumping: Low Chance of Restoring Fish, High Costs



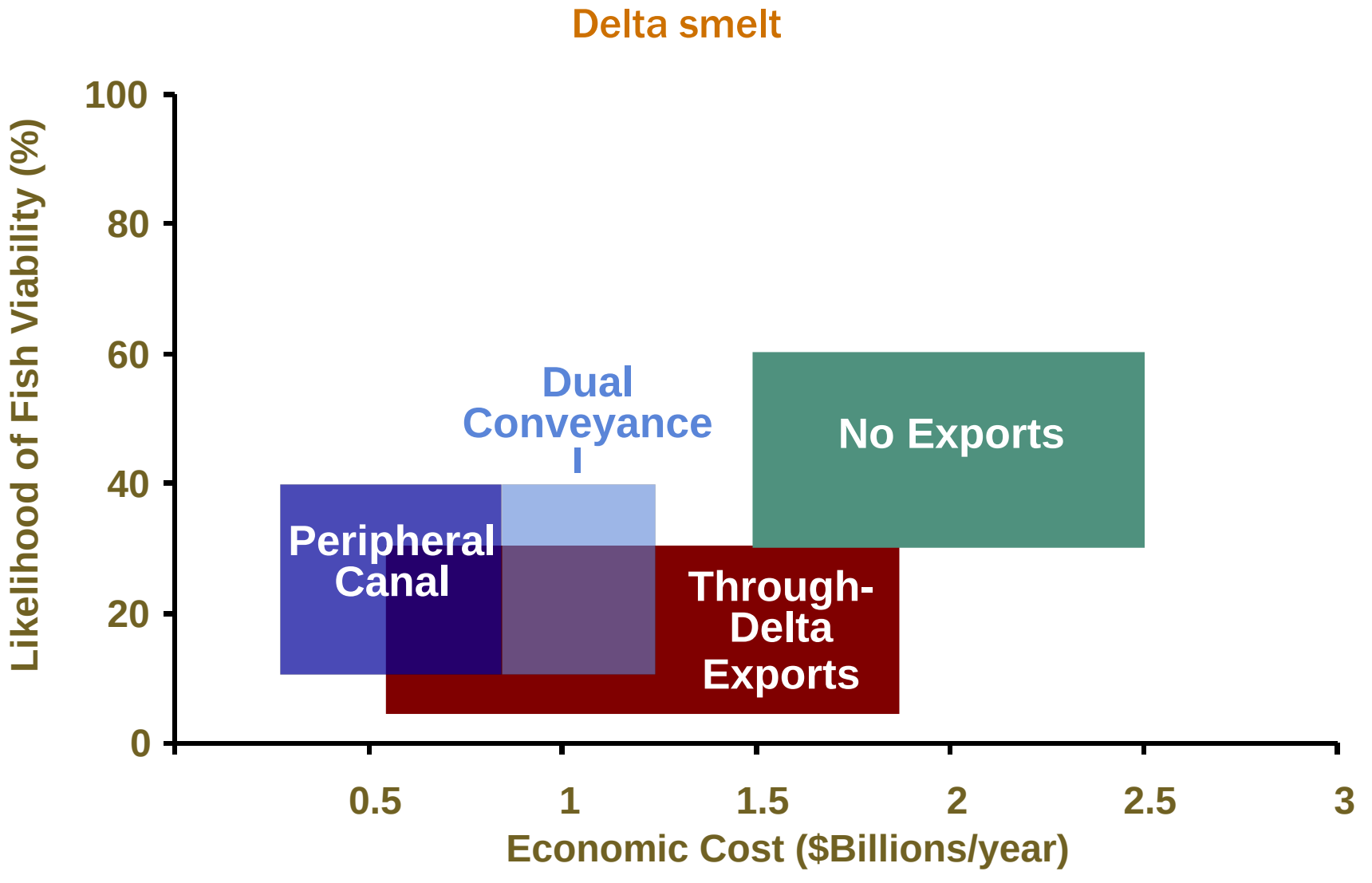
Ending Exports: Better for Fish, But Even More Costly



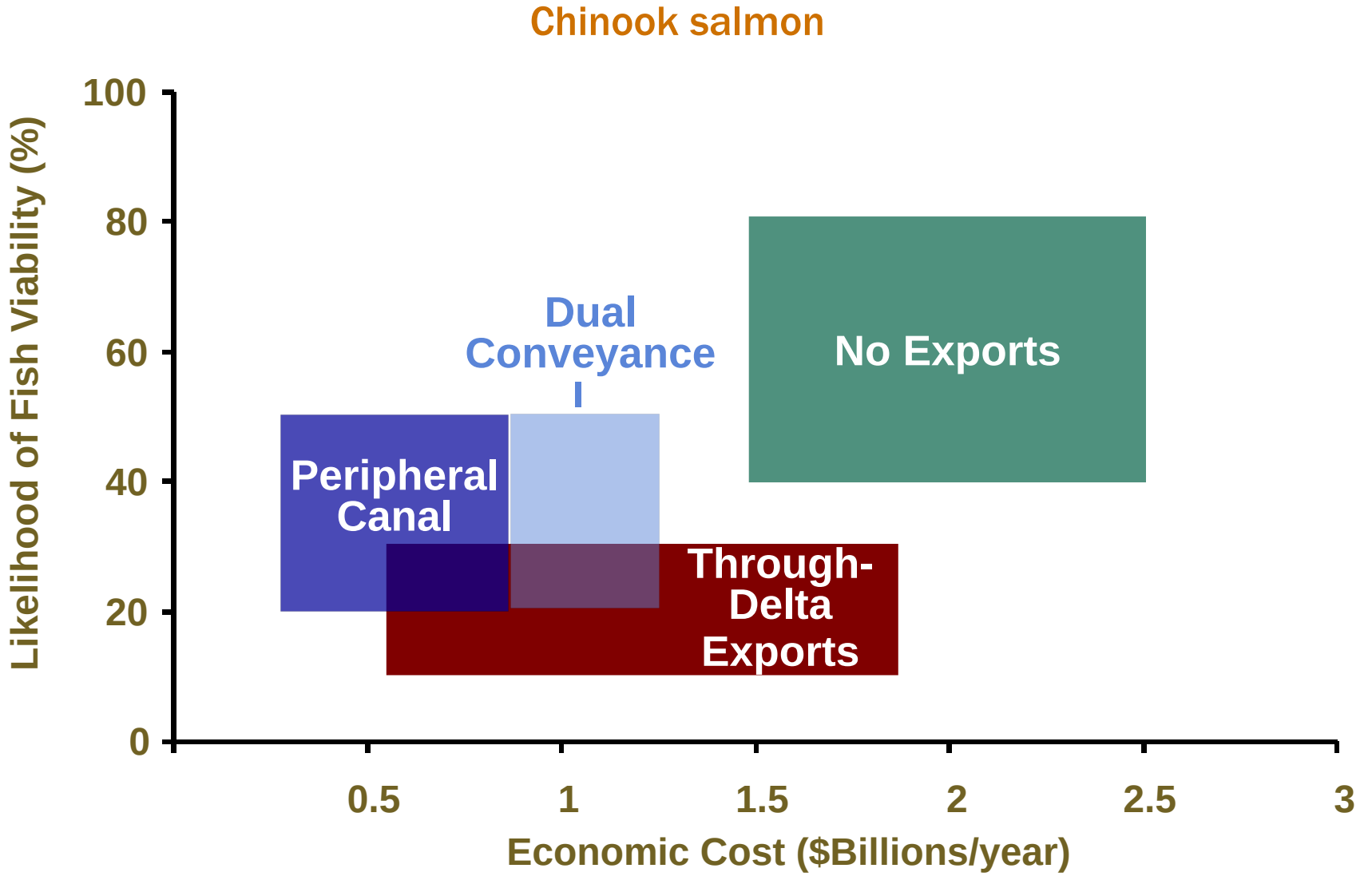
Peripheral Canal: Mid-range for Fish Viability, Least Costly



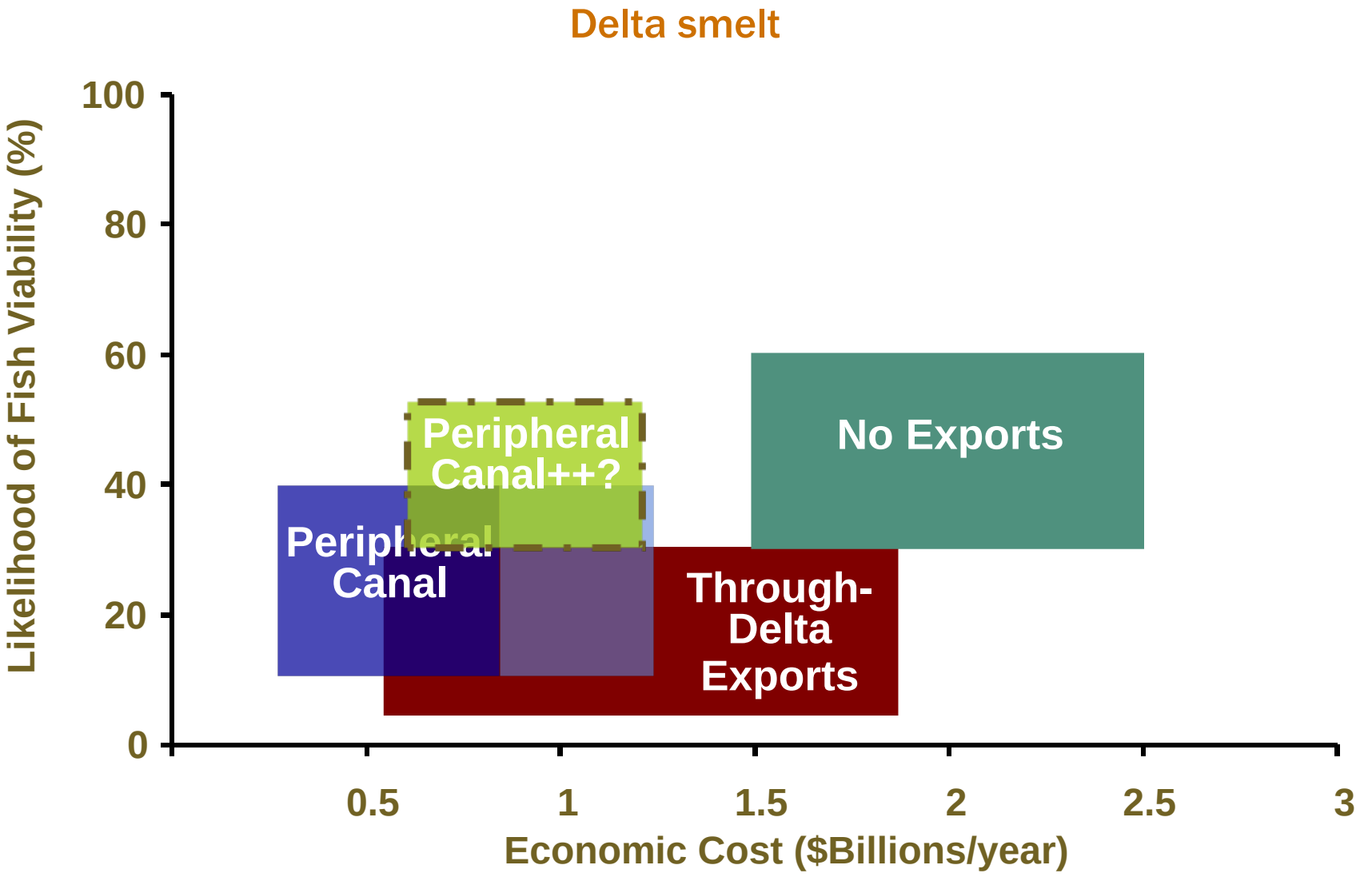
Dual Conveyance: Similar to PC for Fish, Probably More Costly



Similar Ranking for Chinook Salmon



Is there a better tradeoff?



Delta Challenges and Changes

- Sea level rise and climate warming, combined with other external processes, make major change is inevitable in the Delta
- For “co-equal” ecosystem and statewide economic objectives, a peripheral canal appears most promising.
- Regulation and governance of the New Delta will be hard to negotiate.
  - Delta is one example of how climate change will shake up long-cherished notions of environmental management and sustainability

Actively Prepare for a Changing Delta Ecosystem

- Habitat conservation plans should prepare for
  - Climate change
  - Rising sea levels
  - Permanent levee failures
  - New invasive species
- Ecosystem management should favor diverse habitat and flow for multiple species
- Experimentation and detailed modeling needed
  - Include flooding at least one island

Develop a New Framework for Delta Governance and Regulation

- Build a more centralized, decision-capable system
- State leadership (governor and legislature) is required; stakeholders cannot negotiate on their own
- Address regulatory consequences of sea level rise, climate warming, and island failures *now*

For More Information

- Research Brief, main report, and technical appendices available at: www.ppic.org

Photo credit: Harold E. Malde, courtesy of The Nature Conservancy